

## CLAIMS

What is claimed is:

1. A display timing generator for generating timing associated with component video signals in a desired display format, the display timing generator comprising:

a programming interface operative to allow a user to select line types for different lines in a frame and one or more timing parameters associated with a corresponding line type; and

a signal generator operative to receive digital video data and provide the selected line types and timing associated with the selected one or more timing parameters for the different lines in a frame, the selected line types and timing associated with the selected one or more timing parameters being insertable into digital component video signals to provide a desired display format.

2. The display timing generator of claim 1, the one or more timing parameters being user programmable and comprising pulse widths and amplitude levels of horizontal synchronization signals.

3. The display timing generator of claim 1, the one or more timing parameters being associated with excursions of the line types.

4. The display timing generator of claim 1, the programming interface operative to create a line type table which the signal generator utilizes to provide the desired display format.

5. The display timing generator of claim 1, the programming interface operative to allow a user to select from a set of pre-stored line types and associated timing parameters.

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6. The display timing generator of claim 5, the set of pre-stored line types comprising high definition television line types and standard definition television line types.

7. The display timing generator of claim 1, the programming interface operative to allow a user to create custom line types and timing associated with the custom line types in a generic mode.

8. The display timing generator of claim 1, further comprising a state machine that monitors the time duration of video lines and the rise and fall time of the video lines.

9. The display timing generator of claim 1, the display timing generator being operative to receive and provide dedicated horizontal and vertical synchronization signals.

10. The display timing generator of claim 1, being integrated into a component video and personal computer graphics digital-to-analog converter system.

11. The display timing generator of claim 10, the component video and personal computer graphics digital-to-analog converter system being an integrated circuit.

12. The display timing generator of claim 1, the line types comprising at least one of tri-level synchronization signals and bi-level synchronization signals.

13. The display timing generator of claim 1, the line types defining rise and fall times, synchronization shapes and horizontal and vertical timings for providing a desired display format.

14. The display timing generator of claim 1, the display timing generator having a master timing mode that imposes a user defined video display timing format

onto a video source and a slave timing mode that slaves synchronization to a source video format.

15. The display timing generator of claim 14, the display timing generator being programmable to select between the master timing mode and the slave timing mode.

16. The display timing generator of claim 1, the display timing generator being programmable to select between providing dedicated synchronization signals and embedded synchronization signals.

17. A video system comprising:  
a video source that provides digital video data;  
a display timing generator having a plurality of stored line types corresponding to different timing formats of a line, the line types being selectable by a user to provide component video signals with appropriate timing signals to provide a desired display format, the different timing formats having a plurality of timing parameters that are programmable; and  
a digital-to-analog system that inserts the selected timing of the line types into the digital video data and then converts the digital video data into analog component video signals.

18. The system of claim 17, the video source being one of a set-top box, a digital video disc player and a computer graphics card.

19. The system of claim 18, the digital timing generator providing horizontal timing for any of a high-definition television monitor, standard-definition television monitor and a personal computer monitor.

20. The system of claim 17, the display timing generator being operative to receive and provide dedicated horizontal and vertical synchronization signals.

21. The system of claim 17, the display system being one of a high-definition television monitor, standard-definition television monitor and a personal computer monitor.

22. The system of claim 17, the timing signals comprising synchronization signals, serration signals and equalization signals.

23. The system of claim 17, the line types being both high-definition television and standard-definition television line types.

24. A method for programming a display timing generator that provides timing associated with digital component video, the method comprising:  
programming line types for lines to be displayed in a frame;  
programming horizontal timing and voltage levels for the line types; and  
programming horizontal timings and voltage levels for synchronization signals associated with the line types.

25. The method of claim 24, further comprising programming the display timing generator to provide one of embedded and dedicated synchronization signals.

26. A method for providing timing associated with digital component video, the method comprising:

storing a set of line types and timing parameters associated with the line types;  
providing a display timing generator with a programming interface, the programming interface being adapted to allow a user to select between the set of line types and associated timing parameters; and

creating a line type table that provides the display timing generator with the selected line types and associated timing parameters when receiving component video data, so that the display timing generator can provide the selected line types and associated timing parameters to the component video data.

27. The method of claim 26, the line types comprising high definition television line types and standard definition television line types.

28. The method of claim 26, further comprising providing the programming interface with a generic mode that allows a user to create custom line types and associated timing parameters.

29. A display timing generator for generating timing associated with component video signals in a desired display format, the display timing generator comprising:

means for providing the selectability of line types for different lines in a frame and programmability of one or more timing parameters associated with a corresponding line type;

means for storing the selected line types and the one or more programmed timing parameters; and

means for generating the timing signals for digital component video signals based on the selected line types and one or more programmed timing parameters.

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